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Marlene H. Dortch, Secretary
Federal Communications Commission
445 12th Street, SW
Washington, DC 20554

Re: Written *Ex Parte* Presentation
WT Docket No. 07-293; IB Docket No. 95-91

Dear Ms. Dortch:

Sirius XM Radio Inc. (“Sirius XM”) hereby responds to the WCS Coalition’s recent written *ex parte* presentation recommending that the FCC eliminate the power spectral density (“PSD”) limit of 50 mW/MHz imposed on WCS mobile devices.¹ Sirius XM continues to oppose further revising this limit due to the risk of significant interference to Sirius XM and other radio services operating on frequencies adjacent to the WCS band.

The WCS Coalition and AT&T first recommended eliminating the PSD limit on WCS mobile devices in their petitions for reconsideration of the Commission’s 2010 decision in this proceeding.² Sirius XM opposed that aspect of both petitions, explaining: 1) the WCS Coalition had itself proposed the PSD limit that the Commission adopted in the *Order*, 2) other WCS licensees expressly endorsed its application, and 3) the WCS licensees purported to demonstrate the value of that limit at demonstrations conducted in Ashburn, Virginia.³ Sirius XM further showed that “overload” is a significant potential

¹ Letter from Paul J. Sinderbrand, Counsel to the WCS Coalition, to Marlene H. Dortch, Secretary, Federal Communications Commission, WT Docket No. 07-293, IB Docket No. 95-91 (filed December 1, 2011) (“WCS Coalition December 1 Letter”).

² See Petition of the WCS Coalition for Partial Reconsideration, WT Docket No. 07-293, IB Docket No. 95-91, GEN Docket No. 90-357, RM No. 8610 (filed Sept. 1, 2010); Petition for Partial Reconsideration of AT&T Inc., WT Docket No. 07-293, IB Docket No. 95-91, GEN Docket No. 90-357, RM No. 8610 (filed Sept. 1, 2010), seeking reconsideration of the Commission’s decision in Amendment of Part 27 of the Commission’s Rules to Govern the Operation of Wireless Communications Services in the 2.3 GHz Band, WT Docket No. 07-293, *Report and Order*, Establishment of Rules and Policies for the Digital Audio Radio Satellite Service in the 2310-2360 MHz Frequency Band, IB Docket No. 95-91, *Second Report and Order*, 25 FCC Rcd 11710 (2010) (the “*Order*”).

³ See, Sirius XM Radio Inc. Opposition to Petitions for Reconsideration of WCS Coalition and AT&T Inc., WT Docket No. 07-293, IB Docket No. 95-91, Oct. 18, 2010 at 12-14.

source of interference to satellite radio and that without the protection offered by a PSD requirement, WCS transmissions could concentrate the entire 250 mW EIRP of authorized power into a relatively small bandwidth closer to the satellite radio spectrum, which would significantly enhance the likelihood of causing overload interference to Sirius XM's customers.⁴ The Commission has recognized that unwanted WCS energy occupying frequencies nearer the satellite radio allocation increases the potential for interference, which is why the *Order* essentially established frequency "guard bands" to protect satellite radio reception on consumer receivers.⁵

The WCS Coalition continues to argue against this PSD limit, saying it "effectively precludes" the use of LTE technology which it calls "the *de facto* global standard for next generation broadband."⁶ This preclusive effect is apparently predicated on the WCS Coalition's claim that compliance with the PSD limit would "require development of non-standard software features to ensure that this limit is never exceeded, even for an instant."⁷ The WCS Coalition concedes that an alternate method of compliance would be to limit maximum mobile transmit power to 50 milliwatts, but it argues this approach would necessitate a four-fold increase in additional WCS infrastructure.⁸

The WCS Coalition fails to adequately support its recommendation on either policy or technical grounds. First, the WCS Coalition discounts Sirius XM's concerns about the potential for concentrating power in a narrow bandwidth, arguing it would be highly unlikely that "a WCS device using LTE technology in proximity to an SDARS receiver would be assigned repetitive frequency allocations . . . at or near full power for a period of time long enough to cause muting" to an SDARS receiver.⁹ The WCS Coalition further claims that LTE design adequately protects satellite radio receivers and that there would be only "rare" instances when the 50 mW/MHz PSD limit would be exceeded, and those incidents would occur only at or near edge of cell service.¹⁰ However, the probability that a mobile device operates at the edge of a cell depends on many factors, including the number of base stations deployed. Uncertain timing of wireless network buildout and the density of network infrastructure could lead to large service areas located at the outer range of a cell, which comprises the majority of an individual cell coverage area.¹¹ As WCS licensees have been unwilling to provide required information

⁴ *Id.* at 13.

⁵ *Order* at ¶ 63.

⁶ WCS Coalition December 1 Letter at 1.

⁷ *Id.* at 1, Attachment 1.

⁸ *Id.* at 3.

⁹ *Id.* at Attachment 2.

¹⁰ WCS Coalition December 1 Letter at 2.

¹¹ The field tests conducted in Ashburn, Virginia demonstrated WCS mobile device performance within the immediate proximity of a WCS base station but did not demonstrate performance at cell edge. As a result, the WCS Coalition did not test edge-of-cell interference impact of a loaded cellular system to Sirius XM receivers. However, tests conducted by Sirius XM have shown that WCS devices operating with the

about their networks,¹² neither the Commission nor Sirius XM possesses sufficient data on which it can determine whether interference is likely from WCS facilities. Moreover, since WCS licensees have been unwilling to invest more than the minimum necessary to potentially maintain their licenses, sparsely deployed networks are likely to result in higher power operations more often than the Coalition would have the Commission and Sirius XM believe.

Sirius XM opposes any WCS rule change that could further increase the chance of interference to its customers. However, because the Commission has not provided objective benchmarks for quantifying and limiting interference to satellite radio service from WCS devices, there is no way to adequately assess the impact from any incremental interference conditions, even if its occurrence is indeed “rare.”¹³ Sirius XM and its 35 million listeners should not bear the burden of accepting an increased potential for interference simply so that WCS licensees can minimize their product development costs. If the WCS Coalition is correct that LTE devices would exceed the 50 mW/MHz PSD limit only on “very rare occasions,” then requiring WCS licensees to restrict operating power to comply with the rule should have only an acceptably minimal impact on WCS service.

Sirius XM service already operates with a razor-thin margin, which has been significantly compromised by the *Order*. Further, if WCS licensees ever do deploy mobile broadband networks, Sirius XM expects that its service will be further compromised by other operational factors not fully considered in the *Order*. For example, even before the Commission loosened the WCS technical standards, Sirius XM raised concerns about how mobile video chat applications contradict the perception that WCS mobile transmission times will be only short and intermittent, with a low probability of causing interference.¹⁴ The FCC staff and the WCS Coalition minimized these concerns, questioning whether such applications would gain widespread acceptance, but the

maximum permitted 250 milliwatts of power, which simulates cell edge operating conditions, can create significant areas of harmful interference to satellite receivers. *See e.g.*, Letter from James S. Blitz and Terrence R. Smith, Sirius XM Radio Inc., to Marlene H. Dortch, Secretary, Federal Communications Commission, WT Docket No. 07-293 (filed February 27, 2008).

¹² *See* Letter from James S. Blitz and Terrence R. Smith, Sirius XM Radio Inc., to Marlene H. Dortch, Secretary, Federal Communications Commission, WT Docket No. 07-293 (filed December 16, 2011).

¹³ Indeed, the full menu of WCS technical standards, *e.g.*, out-of-band emissions, automatic power control, duty cycle limits and PSD, work together to minimize the potential for interference to satellite radio receivers and other adjacent band services. If the Commission were to relax any one of these components, it would need to strengthen the others so that the overall impact is benign to other spectrum users.

¹⁴ *See* Letter from Michael A. Lewis, Engineering Consultant, Wiley Rein, LLP, Counsel to Sirius XM Radio Inc. to Marlene H. Dortch, Secretary, Federal Communications Commission, WT Docket No. 07-293 (filed February 24, 2010).

popularity of Apple's Face Time application and Skype's video services validate Sirius XM's position.¹⁵

Although the sole basis the WCS Coalition finds to justify eliminating the mobile PSD limit is its claim concerning the capabilities of LTE technology, nothing requires WCS licensees to use LTE nor should the Commission impose any such requirement. Numerous WCS licensees that are not part of the WCS Coalition have expressed interest in using the band for services other than mobile broadband. For example, some licensees want to use the WCS band for fixed, smart grid applications, while others now use the band for fixed, point-to-point microwave services including backhaul operations, and other parties are examining opportunities for using WCS for air-to-ground service.¹⁶ Since LTE technology is not the "global *de facto* standard" for these other types of applications, the Commission must craft WCS service rules so that whatever technology is used for these services will adequately protect Sirius XM from harmful interference. In addition, if history is any guide, LTE will eventually be supplanted with a more advanced platform for mobile applications.¹⁷ Adopting rules predicated on today's technology of choice for only a subset of WCS licensees will ultimately require the Commission and Sirius XM to revisit these same issues in the future.¹⁸ Based on the

¹⁵ The Commission should also not expect that Sirius XM can overcome harmful electrical interference by relying on the four second buffer that the company uses to minimize the effects of fading and obstructions. The protection offered by the buffer is not ubiquitous and relies on clear line of site propagation paths to both satellite streams.

¹⁶ See e.g., Application for Assignment of License, WCS Wireless License Subsidiary, LLC and San Diego Gas & Electric Company, ULS File No. 0004432002 (granted Jan. 5, 2011); Letter from David M. Don, Comcast Corporation, to Marlene H. Dortch, Secretary, Federal Communications Commission, WT Docket No. 10-112 (filed September 9, 2011); Letter from Thomas Gutierrez, Counsel to GoGo, Inc. to Marlene H. Dortch, Secretary, Federal Communications Commission, WT Docket No. 07-293, IB Docket No. 95-91 (filed November 8, 2011).

¹⁷ The WCS Coalition previously encouraged rule changes to accommodate the deployment of IEEE 802-16e WiMAX technology, providing ample evidence that the Commission should not adopt standards based on an industry's currently favored technology. See Comments of the WCS Coalition, WT Docket No. 07-293 at 1 (Feb. 14, 2008). And while it is likely true that LTE will serve a broader global market than WiMAX ever intended, that does not suggest that 2.3 GHz LTE equipment will be available in the U.S. even if the WCS Coalition achieves the regulatory relief it seeks. Other countries, notably China and India, appear to be developing 2.3 GHz band networks using a time division duplex variant of LTE ("TD-LTE"). See, e.g. "TD-LTE Catching Fire, But Challenges Remain", Fierce Broadband Wireless, Sept. 22, 2011, available at <http://www.fiercebroadbandwireless.com/special-reports/td-lte-catching-fire-challenges-remain> (last viewed January 9, 2012). However, the U.S. WCS spectrum has been assigned in paired spectrum blocks that are optimized for frequency division duplex technologies.

¹⁸ Regulatory certainty is imperative for Sirius XM and its customers, since we primarily deliver service through receivers factory-installed in cars, trucks, and other

record before it, the Commission should retain the generic rule and maintain the PSD limit, consistent with the WCS Coalition's own past advocacy.¹⁹

The WCS Coalition concedes that WCS mobile broadband operators could comply with the PSD requirement by developing non-standard software features, but this should be an argument in support of retaining the limit, not for eliminating it. Over the past 14 years, WCS Coalition members have successfully avoided funding any significant product and network development, which is the primary reason the band remains underutilized a decade and a half after the spectrum was auctioned.²⁰ This lack of innovation exists despite the fact that the FCC expressly warned the WCS industry prior to the initial auctions that the band is a challenging spectrum environment due to its adjacency to satellite and aeronautical services.²¹ Since that time, the WCS licensees have adopted a waiting game hoping that the winds of change might somehow blow "off-the-shelf" technology solutions their way.²² Even after receiving *an unprecedented 55 db relaxation* of the WCS out-of-band emissions limits in the *Order*, Coalition members

vehicles having product life cycles of more than ten years. Sirius XM cannot address future changes to the WCS interference environment by simply "churning" consumer equipment every 2 or 3 years as is typically done in the wireless industries.

¹⁹ See, e.g., Letter from Paul J. Sinderbrand, Counsel to the WCS Coalition, to Marlene H. Dortch, Secretary, Federal Communications Commission, WT Docket No. 07-293, IB Docket No. 95-91 (filed May 8, 2009) ("[D]uring the course of the meeting the WCS Coalition took issue with the assertion by Sirius XM that any rules adopted in these proceedings to liberalize the WCS out-of-band emissions mask, coupled with a reduction in permissible WCS mobile power levels, must be crafted in a technology-specific manner.") Ironically, this highlights the WCS Coalition's opposition to Sirius XM's recommendations to develop specific WCS technical standards based on LTE technology.

²⁰ See Letter from James S. Blitz and Terrence R. Smith, Sirius XM Radio Inc., to Marlene H. Dortch, Secretary, Federal Communications Commission, WT Docket No. 07-293 (filed September 7, 2011).

²¹ The WCS licensees' spectrum environment in the 2.3 GHz band is very similar to the environment that LightSquared faces in the 1.6 GHz band. Attempting to coexist with adjacent satellite services has caused LightSquared to spend millions on technology and system modifications. By contrast, the WCS licenses have chosen to pursue regulatory relief to achieve a similar result.

²² The WCS Coalition's argument that it is not realistic to expect vendors to manufacture specialized handsets complying with a "one-off" U.S. 50 mW/MHz limit is a red-herring contradicted by the WCS Coalition's acknowledgement that compliance would require the use of non-standard "software" presumably implemented by the network. If WCS licensees fund the software development, handset vendors should have little issue with implementation.

continue to ask the Commission for more regulatory relief, more technical flexibility and more time to construct their systems.²³

In 2010 the FCC made the conscious choice that it would adopt technology-neutral service rules for WCS. All compliant technologies – even narrowband analog – would be accommodated under the framework that the Commission adopted. Unless the implications for each potential technology are fully tested and assessed, and the interference compatibility with other current and future technologies is addressed, the Commission should not modify these rules to accommodate any one specific technology.

Respectfully submitted,

/s/ James S. Blitz

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²³ Incredibly, WCS Coalition members now seek FCC approval for a construction schedule that ends in 2020 – 23 years after the initial WCS auction. *See* Letter from Paul J. Sinderbrand, Counsel to the WCS Coalition, to Marlene H. Dortch, Secretary, Federal Communications Commission, WT Docket No. 07-293 (filed May 31, 2011).